Fuel Economy Trends and Tools

Rob de Jong, Head Transport Unit
UN Environment Programme
UNEP’s role in the GFEI

- Co-founder GFEI
- Leader in the UN on Climate Change and Transport
- Support to countries to develop fuel economy policies
- Focus on middle and low income countries
- Technical, Policy, Financial, Networking support
Global Fuel Economy Trends
The Contribution of Transport

THE TRANSPORTATION SECTOR
A major contributor to global energy-related CO₂ emissions

GLOBAL ENERGY-RELATED EMISSIONS
≈ 30 Gt CO₂

TRANSPORT EMISSIONS
≈ 7 Gt CO₂

ROAD TRANSPORT EMISSIONS
≈ 5 Gt CO₂

LEGEND

- RAIL
- AIR
- ROAD
- SEA
- HEAVY-DUTY VEHICLES
- LIGHT-DUTY VEHICLES

Sources:
Growth light-duty vehicles between 2005 and 2050

Almost all growth is in developing countries

Source: IEA Energy Technology Perspectives, 2012
Meeting GFEI targets can stabilize global light-vehicle CO$_2$ emissions, despite a near tripling of vehicle fleet.

Meeting GFEI global target can reduce a total of 33 Gt CO$_2$ emissions beyond already adopted policies between 2015-2050.

Adopted policies include vehicle efficiency standards adopted as of February 2014.

GFEI Target aims to reduce fuel consumption of all vehicles in half by 2050.

Source: ICCT Roadmap Model
Deep Transport CO₂ Reductions in ETP-2012 2 Degree Scenario (2DS)

*Fuel economy improvement plays largest role, particularly through 2030*
Global Trends in FE Improvements

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2008</th>
<th>2011</th>
<th>Trend%</th>
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</thead>
<tbody>
<tr>
<td>OECD</td>
<td>8.1</td>
<td>7.6</td>
<td>7</td>
<td>-2.4</td>
</tr>
<tr>
<td>non-OECD</td>
<td>7.5</td>
<td>7.6</td>
<td>7.5</td>
<td>-0.1</td>
</tr>
<tr>
<td>Global</td>
<td>8</td>
<td>7.6</td>
<td>7.1</td>
<td>-1.8</td>
</tr>
</tbody>
</table>
Fuel Economy Policies in Place

August 2014 Update. For additional information visit www.globalfuelleconomy.org
The Need for Cleaner Fuels

Diesel Fuel Sulphur Levels: Global Status
April 2014

*Information in parts per million (ppm)
For additional details and comments per country, visit www.unep.org/transport/pfsv/
Developing National Fuel Economy Policies
Why Countries Improve Fuel Economy

• Reduce pollutant emissions
• Reduce oil dependence
• Improve balance of payments
• Reduce transport cost consumers and companies
• Reduce cost public transport
• Reduce greenhouse gases
• Promote domestic economies/jobs
Developing Automotive Fuel Economy Policy at the National Level:

Areas of GFEI Support

I. Plan & Design

- **Build National Partner Capacity** re: Auto Fuel Economy Issues and Approaches
- **Auto Fuel Economy Baseline + Projection**
  - Data gathering and analysis
  - Communication and publication of data results
  - Identification of trends
- **Coalition Building and Consultation**
  - Private sector participation
  - Intra-governmental working group(s)
  - National working sessions
- **Policy Choice and Design**
  - Consideration of feasible policy options:
    - Standards (yes/no?)
    - Fiscal instruments (e.g. fee bate)
    - Information (e.g. labeling)
- **Propose and Communicate National Plan**
  - Drafting of plan
  - High Level consultation
  - Presentation to relevant government agencies

II. Implement

- **Continued Support for National Discussions on Fuel Economy**
  - Sustained political pressure and lobbying for fuel economy
- Introduction of Draft Plans to National Committee(s), Working Groups
- Adoption into National Policy
- Adoption into Law, Official Gazette
- Development of Standard by Standards Body

III. Monitor

- Yearly National Auto Fleet Fuel Economy Measurements
- Oil use, import data and road transport (LDV) use

IV. Evaluate

- Refinement of national policy, standards according to evidence and trends
How GFEI Can Help

• Tools
  – Baseline setting
  – Overall GFEI toolkit
  – Policies impact tool
  – Fee bate tool
• Expert Network & Regional Partners
• Sharing Best Practices
• Publications
  – State of the World Fuel Economy
• Financial support
  – GEF, EU, GFEI Partners, ....
Setting a Baseline
### Setting Fuel Economy Baselines

<table>
<thead>
<tr>
<th></th>
<th>Ethiopia</th>
<th></th>
<th>Kenya</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average (l/100km)</td>
<td>8.4</td>
<td>8.4</td>
<td>7.69</td>
<td>7.6</td>
</tr>
<tr>
<td>Diesel</td>
<td>9.3</td>
<td>9.4</td>
<td>8.67</td>
<td>9.09</td>
</tr>
<tr>
<td>Petrol</td>
<td>7.8</td>
<td>7.4</td>
<td>7.52</td>
<td>7.2</td>
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</table>
Comparison of passenger vehicle GHG standards

Solid dots and lines: historical performance
Solid dots and dashed lines: enacted targets
Solid dots and dotted lines: proposed targets
Hollow dots and dotted lines: target under study

Kenya

* China's target reflects gasoline vehicles only. The target may be lower after new energy vehicles are considered.
Technical Information and Policy Options
GFEI Toolkit (2)

- Examples of Auto Fuel Economy Policies
- Policy Briefs (feebates, imports, labels)
- Technical Guides (fuels, vehicles, calculating emissions)

- [www.unep.org/transport/gfei/autotool](http://www.unep.org/transport/gfei/autotool)
Technical Information and Policy Options
Fuel Economy Policies Impact Tool (FEPIt)

• simulation tool that assists users in setting auto fuel economy targets
• by estimating the impact of fuel economy policies
• Estimates what a set of fuel economy policies (and their level of ambition, low-high) can deliver in terms of average auto fuel economy in 5-10 + years

FEPIt example: Georgia


2. Baseline FE policy situation as of 2012:
   • Moderate fuel tax in place
   • No fuel economy label
   • No registration / ownership tax based on CO2
   • No restriction on used imports (age)
   • No FE standard

....

RESULTS:
<table>
<thead>
<tr>
<th>Policy Options</th>
<th>Today</th>
<th>To be deployed by 2020</th>
<th>Policy Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fuel Options</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel Tax</td>
<td>Moderate</td>
<td>High Tax</td>
<td>Important</td>
</tr>
<tr>
<td>Fuel tax differentiation</td>
<td>None</td>
<td>High</td>
<td>Important</td>
</tr>
<tr>
<td>(lower tax for diesel)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vehicle Options</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labelling</td>
<td>None</td>
<td>High</td>
<td>Important</td>
</tr>
<tr>
<td>CO₂-Based Vehicle acquisition tax</td>
<td>None</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>CO₂-Based Vehicle ownership tax</td>
<td>None</td>
<td>High</td>
<td>Very High</td>
</tr>
<tr>
<td>Used Imports restriction</td>
<td>Low</td>
<td>High</td>
<td>Small</td>
</tr>
</tbody>
</table>

**2020 expected FE**

- if policy status quo: **175 gCO₂/km**
- if policies implemented: **145 gCO₂/km**
Where is Georgia heading?

- Georgia BAU
- Georgia w/FE policy

Solid dots and lines: historical performance
Solid dots and dashed lines: enacted targets
Solid dots and dotted lines: proposed targets
Hollow dots and dotted lines: target under study

Source: adapted from ICCT
Using Economic Instruments
Upcoming:Feebate Simulation Tool

Feebate Function Control Panel

Quick Start

Choose country: Germany
Submit
Start year: 2014

Pivot Point Control?

Annual adjustment based on observed changes
Revenue neutral system

Metrics?

CO2 Emissions

Units

Kilometers
LiKes

Feebate Function Shape Control

Shape examples: Linear
Pivot Point 168

How many sections? 4
Mid-section values:
1 96 192 288 385
Shape of the individual sections:
SLOPED SLOPED SLOPED SLOPED
Reference CO2:
Rate USD per g of CO2 / Kilometer:
30 30 30 30

Advanced Controls

CO2 Emissions, grams of CO2 / Kilometer
Design of a feebate system

The graph illustrates the relationship between $g/km CO_2$ and financial incentives (fees and rebates). The slope of the line determines marginal costs and benefits. A pivot point can be designed to meet revenue goals.
Example : Mauritius

• Increasing fleet – almost doubled in 10 years; increasing need for petroleum imports; increasing air pollution

• Introduced cleaner fuels - unleaded and low sulfur fuels (50 ppm)

• Introduced a carbon tax:
  – FEE: 159 CO2 gr/km: Rs 2,000 per gm/km going to Rs 5,000 above 290 gm/km
  – REBATE: 158 gm/km: Rs 1000 going to Rs 3,000 below 90 gm/km
  – Now further tightened to 150 gm/km
GFEI Phases

**PHASE I**  
4 PILOTS & TOOL  
2009 - 2014

**CASE STUDIES TOOLKIT**

**PHASE II**  
REGIONAL PROJECTS: 15-20 COUNTRIES  
2013 - 2017

**REGIONAL APPROACHES**

**PHASE III**  
GLOBAL ROLL OUT: 50+ COUNTRIES  
2014 - 2017
GFEI Country Engagement

Pilot Countries
Chile
Ethiopia
Indonesia
Kenya

Second Phase Countries
Bahrain
Côte d'Ivoire
Egypt
Georgia
Jamaica
Jordan
Macedonia
Mauritius
Montenegro
Morocco
Peru
Philippines
Thailand
Uruguay
Vietnam

Under Discussion
Serbia
Barbados
Benin
Russia
St Lucia

Countries Expressing Interest
Armenia
Azerbaijan
Bangladesh
Guatemala
Mali
Mozambique
Nigeria
Paraguay
Sri Lanka
Syria
Togo
Uganda
Zambia
Colombia
Costa Rica
Malaysia
Nepal

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